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Claims 1thru 17 are cancel

18. (Amended) A method for producing tubular carbon molecules of about 5 to 500 nm in length, said method comprising the steps of:

(a) providing a single-wall carbon nanotube-containing material;

(b) cutting single-wall nanotube containing-material to form a mixture of tubular carbon molecules having lengths in the range of about 5 to 500 nm;

(c) isolating from said mixture of tubular carbon molecules a fraction of said molecules having substantially equal lengths.

19. (Amended) The method of claim 18 wherein said cutting single-wall nanotubes into tubular carbon molecules comprising the steps of:

(a) forming a substantially two-dimensional target containing single-wall nanotubes of lengths up to about one micron or more; and

(b) irradiating said target with a high-energy beam of high mass ions.

20. The method of claim 19 wherein a high energy beam is produced in a cyclotron and has an energy of from about 0.1 to about 10 GeV.

21. The method of claim 19 wherein said high mass ion has a mass of greater than about 150 AMU.

22. The method of claim 21 wherein said high mass ion is selected from the group consisting of gold, bismuth and uranium.

23. (Amended) The method of claim of 22 wherein the high mass ion is Au^{+33}.

24. The method of claim 18 wherein said cutting single-wall nanotubes into tubular carbon molecules comprises the steps of:

(a) forming a suspension of single-wall nanotubes in a medium;

(b) sonicating said suspension with acoustic energy.

25. The method of claim 24 wherein said acoustic energy is produced by a device operating at 40 KHz and having an output of 20 W.

26. The method of claim 18 wherein said cutting single-wall nanotubes into tubular carbon molecules comprises refluxing single wall nanotube material in concentrated HNO_3.

27. The method of claim 19 further comprising the step of heating the tubular carbon molecules to form a hemispheric fullerene cap on at least one end thereof.

28. The method of claim 18 further comprising the step of reacting said tubular carbon molecules with a material which provides at the reaction conditions at least one substituent on at least one of said ends of said tubular carbon molecule.

29. The method of claim 26 further comprising the step of reacting said tubular carbon molecules with a material which provides at the reaction conditions at least one substituent on at least one of said ends of said tubular carbon molecule.

30. (Amended) The method of claim 28 wherein said substituent is selected from the group consisting of hydrogen; alkyl; acyl; aryl; arulkyl; halogen; substituted thiol; unsubstituted thiol; substituted amino; unsubstituted amino; hydroxy; and OR', wherein R' is selected from the group consisting of alkyl, acyl, aryl, aralkyl, substituted thiol, unsubstituted thiol, substituted amino, unsubstituted amino, a linear carbon chain, and a cyclic carbon chain.

Claims 31 thru 162 are cancel

163. (New) The method of claim 30 wherein the linear carbon chain, the cyclic carbon chain, or both, are interrupted by at least one heteroatoms.

164. (New) The method of claim 30 wherein the linear carbon chain, the cyclic carbon chain, or both, are substituted with a moiety selected from the group consisting of at least one =O, =S, hydroxy, aminoalkyl, amino and a peptide of 2-8 amino acids.

165. (New) The method of claim 29 wherein the substituent is selected from the group consisting of alkyl; acyl; aryl; aralkyl; halogen; substituted thiol; unsubstituted thiol; substituted amino; unsubstituted amino; hydroxy; and OR', wherein R' is selected from the group consisting

of alkyl, acyl, aryl, aralkyl, halogen, substituted thiol, unsubstituted thiol, substituted amino, unsubstituted amino, a linear carbon chain and a cyclic carbon chain.

166. (New) The method of claim 165 wherein the linear carbon chain, the cyclic carbon chain, or both, are interrupted by at least one heteroatoms.

167. (New) The method of claim 165 wherein the linear carbon chain, the cyclic carbon chain, or both, are substituted with a moiety selected from the group consisting of at least one =O, =S, hydroxy, aminoalkyl, amino and a peptide of 2-8 amino acids.

168. (New) A method for producing substantially un-tangled single-wall carbon nanotubes comprising:

(a) providing tangled single-wall carbon nanotubes;

(b) forming a suspension of the tangled single-wall carbon nanotubes in a liquid medium, wherein the liquid medium comprises a solution selected from the group consisting of an aqueous solution, a solution comprising sodium dodecyl sulfate, a solution comprising non-ionic surfactant and combinations thereof;

(c) cutting at least a portion of the single-wall carbon nanotubes to untangle at least some of the single-wall carbon nanotubes; and

(d) recovering material comprising single-wall carbon nanotubes untangled by the cutting step.

169. (New) The method of claim 168 wherein the tangled single-wall carbon nanotubes comprise ropes of single-wall carbon nanotubes.

170. (New) The method of claim 169 wherein the cutting step comprises sonication and wherein at least one of the ropes is cut.

171. (New) The method of claim 168 further comprising fractionating the single-wall carbon nanotubes into at least one fraction of the single-wall carbon nanotubes having a homogeneous

characteristic selected from the group consisting of lengths, diameters, helicities and combinations thereof.

172. (New) The method of claim 171 wherein the fractionating step comprises a method selected from the group consisting of field-flow fractionation, light scattering methods and combinations thereof.

173. (New) The method of claim 168 wherein the suspension is a stable colloidal suspension.

174. (New) A method comprising:

(a) applying an electric field to a suspension of single-wall carbon nanotubes; and

(b) removing the single-wall carbon nanotubes from the suspension.

175. (New) A method of forming a film comprising:

(a) providing a suspension of single-wall carbon nanotubes; and

(b) electrodepositing the single-wall carbon nanotubes on a surface to form a film of single-wall carbon nanotubes.